# SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for the

RIO GRANDE DRAINAGE BASIN

April 1, 1943

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Issued by the
United States Department of Agriculture
Soil Conservation Service
Division of Irrigation
In Cooperation with
The Colorado Agricultural Experiment Station
Colorado State College
Fort Collins, Colorado

April 10, 1943

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The following data pertaining to snow surveys and irrigation water-supply forecasts are provided by the Division of Irrigation, Soil Conservation Service of the U.S. Department of Agriculture, in cooperation with other Federal Bureaus, State Departments, and local organizations. The snow measurements are made principally by field personnel of the U. S. Forest Service, U. S. Indian Service and Colorado State Engineer. This work is otherwise conducted cooperatively with the State Engineers of Colorado and New Mexico, Colorado Agricultural Experiment Station, and various municipalities, irrigation associations and others. Precipitation records are supplied by the U. S. Weather Bureau.

## PRECIPITATION DATA

| WATERSHED | STATE | Precipitation October 1 to March 31 | Departure from Normal | Precipitation March | Departure from Normal |
|---|---|---|---|---|---|
| | | Inches | Inches | Inches | Inches |
| Canadian | New Mexico | 3.78 | -0.28 | 0.19 | -0.59 |
| Rio Grande | Colorado | 10.37 | +1.13 | 1.88 | -0.39 |
| Rio Grande (N) | New Mexico | 5.26 | -1.30 | 1.22 | -0.04 |
| Rio Grande (S) | New Mexico | 3.14 | -0.70 | 0.45 | -0.19 |
| Pecos | New Mexico | 4.22 | -0.23 | 0.24 | -0.55 |

During March the precipitation over the Rio Grande, Canadian and Pecos drainage areas was below normal. The total rainfall for these areas since October first last year was also below normal except in the San Luis Valley where the accumulated precipitation is somewhat in excess of normal.

## SUMMARY OF APRIL 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS YEARS BY WATERSHEDS

| WATERSHEDS | Snow Depth | | | Water Content | | | Number Courses in Average | Snow Density | | | 1943 Water Content in percent of | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Seven year Avg.* | 1942 | 1943 | Seven year Avg.* | 1942 | 1943 | | Seven year Avg.* | 1942 | 1943 | Seven year Avg.* | 1942 |
| | In. | In. | In. | In. | In. | In. | | Percent | Percent | Percent | | |
| Rio Grande | 27.3 | 31.8 | 21.8 | 9.0 | 9.6 | 7.4 | 23 | 33 | 30 | 34 | 82 | 77 |
| Canadian River | 13.2 | 13.4 | 5.2 | 4.3 | 4.3 | 2.0 | 2 | 33 | 32 | 38 | 47 | 47 |

*Some for shorter periods

## WATER SUPPLY OUTLOOK

Rio Grande. The average water content of the snow, based on recent surveys over the headwaters of the Rio Grande and tributaries in the San Luis Valley area and northern New Mexico, is about 80 percent of that of a year ago. At high elevations, the snow cover is equal to or slightly greater than that of last year while for the tributaries in northern New Mexico the water content is about 50 percent less than a year ago. Soil moisture in the irrigated areas, both New Mexico and Colorado, is reported to be poor to fair and tributary stream flow above normal. The flow in the Rio Grande, in New Mexico, is at low stage. Reservoir storage in the San Luis Valley increased slightly during March and it is probable that the spring run-off will fill the principal reservoirs to normal capacity. Sanchez Reservoir on the Culebra will store some additional water during the early run-off. Present storage is ample for this coming season. There has been an increase of about 7,000 acre-feet in El Vado Reservoir on the Chama during March, bringing the total to 57,000. The combined storage in Caballo and Elephant Butte reservoirs is now 1,994,600 acre-feet or about 80 percent of capacity. The coming run-off may fill these reservoirs to capacity. The general outlook for the irrigation water supply in the Rio Grande drainage is favorable at this time. Present snow conditions indicate that the run-off will not exceed that of last year. However, since there will be a substantial supply in storage, no material water shortage is expected this season in the San Luis Valley area. Ample water for irrigation will be available for the Lower Rio Grande Valley.

Canadian and Pecos Rivers. On the headwaters of the Canadian the water content of the snow is about 1/2 of that of a year ago and less than the past seven year average. The run-off from the snow-melt will be small this spring. During March, at Tucumcari, no precipitation was recorded. Soil moisture is poor in this area and stream flow is low. Range conditions are poor. Conchas Reservoir received additional storage during March of some 6,000 acre-feet, bringing the total available to 293,000. The outlook for the Pecos drainage also is not encouraging at this time. The water content of the snow at Cowles is now less than 3 inches as compared with about 4½ inches a year ago. In the Carlsbad area soil moisture is poor and range conditions are becoming serious. Stream flow is a below normal. Crops where irrigated are in good condition. Reservoir storage for the Project is ample for the irrigation needs this season.

# RIO GRANDE WATERSHED

Summary of Federal and State Cooperative Snow Surveys
Issued April 10, 1943, at Fort Collins, Colorado

| No. | Main Drainage and Snow Course | Local Drainage | Location | | | Elev. | National Forest | Apr. 1 Snow Cover Measurements | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | State | Locality | Description | | | Av. Snow Depth | | | Av. Water Content | | |
| | | | | | | | | Av.@ | 1942 | 1943 | Av.@ | 1942 | 1943 |
| | RIO GRANDE | | | | | | | In. | In. | In. | In. | In. | In. |
| 26 | Wolf Creek Pass | South Fork | Colo. | Wolf Cr.Pass | 4-37N-2E | 10000 | Rio Grande | 84.1 | 82.9 | 73.8 | 30.4 | 29.1 | 30.0 |
| 27 | Upper Rio Grande | Rio Grande | " | Rio Grande Res. | 13-40N-4W | 9350 | " " | 20.4 | 23.5 | 22.4 | 4.8 | 5.7 | 5.8 |
| 47 | Silver Lakes | Alamosa R. | " | 1mi.S.Silver L. | 15-36N-5E | 9600 | " " | 19.5 | 18.8 | 18.5 | 5.3 | 4.6 | 4.7 |
| 49 | River Springs | Conejos R. | " | 10mi.W.Mogote | 25-33N-6E | 9300 | " " | 23.9 | 24.6 | 20.1 | 7.1 | 6.7 | 6.5 |
| 74 | LaVeta Pass #2 | SanCristo Cr. | " | LaVeta Pass | 22-28S-70W | 9300 | SanCristoGr | 25.5 | 27.5 | 19.3 | 7.4 | 7.2 | 4.7 |
| 76 | Summitville | Wightman Cr. | " | Summitville | 30-37N-4E | 11500 | Rio Grande | 66.1 | 82.5 | 59.0 | 20.3 | 22.1 | 19.1 |
| 77 | Cumbres Pass #2 | Los Pinos R. | " | Cumbres Pass | 17-32N-5E | 10000 | " " | 73.2 | 71.1 | 70.3 | 28.3 | 24.5 | 26.3 |
| 80 | Santa Maria | N.Clear Cr. | " | Santa Maria Res. | 8-41N-2W | 9700 | " " | 12.4 | 16.6 | 20.2 | 3.8 | 3.4 | 8.4 |
| 82 | Culebra | Culebra R. | " | 12mi.E.SanLuis | 37.2N105.2W | 10000 | SanCristoGr | 34.2 | 38.3 | 14.9 | 11.2 | 11.4 | 5.4 |
| 84 | Fort Garland | Big Ute Cr. | " | 6mi.N.Ft.Garland | 13-29N-72W | 8200 | " " " | 11.5 | 9.0 | 0.0 | 4.3 | 3.0 | 0.0 |
| 1 | Red River | Red River | N.Mex. | 6mi.SE.RedRiver | 29-28N-15E | 9500 | Carson | 25.5 | 29.3 | 19.6 | 8.9 | 8.5 | 7.8 |
| 2 | Taos Canyon | Rio de Taos | " | 14mi.E.Taos | 10-25N-15E | 9000 | " | 17.7 | 24.0 | 8.9 | 6.0 | 7.4 | 3.5 |
| 4 | Aspen Grove | Rio En Medio | " | 10mi.NE.SantaFe | 12-18N-10E | 9100 | Santa Fe | 11.1 | 15.5 | 11.4 | 3.4 | 4.4 | 3.0 |
| 5 | Lee Ranch | Jemez Cr. | " | 5mi.NW.Bland | 3-18N-4E | 9050 | " " | 25.0 | 31.1 | 17.2 | 8.3 | 9.4 | 5.3 |
| 6 | Canjilon | Canjilon Cr. | " | 8mi.NE.Canjilon | 4-26N-6E | 9500 | Carson | | 58.6 | | | 23.9 | |
| 7 | Rio Nutrias | Rio Nutrias | " | 10mi.SE.ParkView | 6-27N-5E | 7900 | " | | 17.0 | | | 3.8 | |
| 9 | Hematite Park* | Red River | " | 3mi.SE.Red R. | 8-28N-15E | 9500 | Carson | 15.8 | 20.6 | 5.3 | 5.1 | 5.9 | 2.1 |
| 12 | Tres Ritos | Agua Piedra | " | 7mi.W.Holman | 23-22N-13E | 9000 | " | 15.4 | 31.0 | 11.8 | 4.9 | 10.0 | 3.2 |
| 15 | Pay Role | Rock Creek | " | 4mi.SE.Hopewell | 16-28N-7E | 10000 | " | 32.5 | 34.2 | 26.5 | 9.8 | 9.6 | 6.8 |
| 16 | Jicarilla | Rock Lake Cr. | " | 15mi.S.Dulce | 9-29N-1W | 8500 | JicarillaR | 6.5 | 11.7 | 0.0 | 2.2 | 3.6 | 0.0 |
| 17 | Chama Divide | Willow Creek | " | 6mi.W.Chama | 36.9N106.7W | 7750 | Off Forest | 8.3 | 17.1 | 0.0 | 2.9 | 5.1 | 0.0 |
| 18 | Chamita | Chamita Cr. | " | 6mi.NW.Chama | 36.9N106.7W | 8500 | " " | 30.9 | 36.5 | 25.3 | 9.8 | 11.0 | 8.7 |
| 19 | Cordova | Cordova Canyon | " | 2mi.W.TresRitos | 22-22N-13E | 10100 | Carson | 43.1 | 53.2 | 33.0 | 13.6 | 16.8 | 10.3 |
| 20 | Panchuela #2 | Panchuela Cr. | " | 2mi.N.Cowles | 27-19N-12E | 8300 | Santa Fe | 6.5 | 12.3 | 8.8 | 2.2 | 4.3 | 2.9 |
| 21 | Big Tesuque | Big Tesuque Cr. | " | 10mi.NE.SantaFe | 17-18N-11E | 10000 | " " | 18.3 | 21.1 | 15.5 | 6.3 | 7.3 | 5.3 |
| | | | | | Average for drainage | | | 27.3 | 31.8 | 21.8 | 9.0 | 9.6 | 7.4 |
| | CANADIAN | | | | | | | | | | | | |
| 9 | Hematite Park | Moreno Creek | N.Mex. | 3mi.SE.Red R. | 8-28N-15E | 9500 | Carson | 15.8 | 20.6 | 5.3 | 5.1 | 5.9 | 2.1 |
| 10 | Ocate Mesa | Ocate Creek | " | 3mi.E.Black L. | 25-24N-16E | 9200 | Off Forest | 10.5 | 6.1 | 5.0 | 3.5 | 2.7 | 1.9 |
| | | | | | Average for drainage | | | 13.2 | 13.4 | 5.2 | 4.3 | 4.3 | 2.0 |

*On adjacent drainage
@Average for period of record.